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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/752,993	Applicant(s) NAKAJIMA, SETSUO	
	Examiner Steven H. Rao	Art Unit 2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/19/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment***

Applicants' response filed on November 23, 2005 has been entered and forwarded to the Examiner on November 30, 2005.

Therefore claims 1-36 as previously recited are currently pending in the Application.

***Information Disclosure Statement***

The IDS filed on September 19, 2005 has been considered and the initialed copy of the PTO-1449 placed in the file, along with instructions to the contract staff to mail a copy of the initialed 1449 with the instant Office Action.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993), *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982), *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970), and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the continuing application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a

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terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim s 1-27 of U.S. Patent No. 6,706,568.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the only difference between the claims of the U.S. Patent No. 6,706,568 and applicants' present invention is that the present invention as claimed omits the step "forming an oxide film on a surface of the above semiconductor film ". However it is noted that claims 1-27 of the 6,706,568 ANTICIPATE claims 1-36 of the instant application. E.g.

Claim 1 of 6,706,568 recites all steps of claim 1 of the instant application and additionally recites the step of forming an oxide film on a surface of the above semiconductor film . Similarly claims 2-36 are also anticipated by claims 1-27 of the 6,706,568 patent.

Applicants' have not provided any Statutory, Fed. Regulatory, MPEP or any other basis on which the double patenting rejection can be held in abeyance and therefore the Examiner cannot hold in abeyance and issue an Office Action , including therein a relief that is not authorized by the Statute, Fed. Reg., MPEP, etc.

Applicants' request to hold in abeyance the double patenting rejection is not persuasive also at least for the reason that Applicants' Have not amended any claims and if held in abeyance and because the same claims are rejected twice Applicants'

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choose to appeal then the double patenting issue may not be considered therefore the abeyance cannot be granted and the double patenting rejection is made Final.

***Claim Rejections - 35 USC Section 112***

Claims 1-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claims 1, 7, 13, 19, 25 and 31 fail to recite the step of "forming an oxide film on a surface of the above semiconductor film" therefore the claims) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants' invention as described in their specification as originally filed ONLY describes radiating the semiconductor film through an oxide layer that covers the semiconductor film, therefore the step of radiating the semiconductor film by the first laser beam without an oxide covering layer is not described in the specification and not enabled. ( all of the embodiments in the specification) .

Further the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam ( at particular parameters e.g. ARF laser at 193nm at 30 Hz and energy density mJ/cm<sup>3</sup>) is described in their specification as originally filed ONLY as the step (of the second laser beam radiation) to perform

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abrasion of the oxide film on the crystallized semiconductor film thereby eliminating the oxide film. As Applicants' presently recited independent claims do not recite semiconductor film as having an oxide film there is no need to perform the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam because it is not necessary to perform abrasion of the oxide film on the crystallized semiconductor film thereby eliminating the nonexistent oxide film.

Further the step of radiating the semiconductor film with a third laser beam after radiating with the second laser beam is also not necessary since the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam because it is not necessary to perform abrasion of the oxide film on the crystallized semiconductor film thereby eliminating the nonexistent oxide film, therefore there is no Necessity of performing the third step.

Therefore the invention as a whole which consists of treating a semiconductor Film having an oxide film there over with radiation of three kinds of Laser beams to from A level/smooth semiconductor film falls apart.

Further all the embodiments in the specification describe the step of forming an Oxide film on a surface of the above semiconductor film to form a semiconductor film Having a leveled surface, which are necessary for the invention to produce the desired Results:

( a ) "the roughness of the inter face between the semiconductor layer and the gate insulating film traps a carrier ( electron ) flowing through the channel forming region so that the carrier would become a fixed electric charge to vary a threshold voltage,

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which causes decline in reliability .'

(b) the presence of the oxide film is necessary for the laser beam radiation of the semiconductor film in order from ( of ) the first condition, second condition and the third condition enables a process from crystallization to leveling to be performed without changing an atmosphere in a process room which can shorten time for operation and reduced costs.

( c) the presence of the oxide film is necessary for the laser beam radiation of the semiconductor film in order from ( of ) the first condition, second condition and the third condition enables a process from crystallization to leveling to be performed without changing an atmosphere in a process room which can shorten time for operation thus providing a process wherein the substrate is not contaminated since the process from crystallization to leveling can be continuously carried out without exposure to air .

( d) the step of forming an oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface which are necessary for the invention to produce the desired result of a level surface of the semiconductor film which reduces/ eliminates the electric field focusing problem.

(e) the step of forming an oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface which are necessary for the invention to produce the desired result of a level surface of the semiconductor film which reduces/ eliminates the presence of current if OFF position due to the stability of the thickness ( i.e. leveling of the surface).

The dependent claims are rejected for depending from rejected independent

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claims. ( For response to Applicants' arguments section below).

***Duplicate Claims Warning***

Applicant is advised that should claims 7-12 be found allowable, claims 13- 18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim.

See MPEP Section 706.03(k). ( for arguments see section below).

***Claim Rejections - 35 USC Section 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

(The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore,



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the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Nita et al. ( U.S. Patent No. 6,304,329 herein after Nitta). ( For response to Applicants' arguments see section below).

With respect to claim 1 Nitta describes a method for manufacturing a semiconductor device comprising: forming a semiconductor film over an insulating surface (Nita col. 9 lines 2-3-SOI. Fig. 1 13 on 11) radiating the semiconductor film with a first laser beam, ( Nitta col. 12 line 63 # 52 ) radiating the semiconductor film with a second laser beam after radiating with the first laser beam; ( Nitta col. 12 line 63 # 53) and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, ( Nitta col. 12 line 63 # 54) wherein a wavelength of the second laser beam (  $\Lambda_2$  ) and a wavelength of the third laser beam (  $\Lambda_3$  ) are different from a wavelength of the first laser beam (  $\Lambda_1$  Col. 12 lines 64-65,  $\Lambda_1 = 1.55$ ,  $\Lambda_2 = 1.4$  and  $\Lambda_3 = 1.8$ ).

With respect to claim 5 Nitta describes the method for manufacturing the semiconductor device according to Claim 1, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. (Nita col. 9 lines 26-33).

### ***Claim Rejections - 35 USC Section 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action'.

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 2-3,7-9, 11, 13-15,17,25-28 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. ( U.S. Patent No. 6,304,329, herein after Nitta) as applied to claims 1,5 above and further in view of Mitnaga et al. ( U.S. Patent No. 5,808,321, herein after Mitnaga). ( For response to Applicants' arguments see section below).

With respect to claim 2 Nitta describes the method for manufacturing the semiconductor device according to Claim 1 , wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film. Nitta describes the semiconductor device of claim 1, but does not specifically mention its laser treatment is for the purpose of forming a crystallized semiconductor film.

It is noted that the functional recitation , "wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film" has not be given patentable weight because it is narrative in form . In order to be given patentable weight, a functional recitation must be expressed as a " means " for

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performing the specified function, as set forth in 35 USC Section 112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language . In re Fuller, 1929 C.D. 172, 388 O.G. 279.

However , assuming arguendo that Applicants' have recited the limitation in proper format, Mitnaga a patent from the same filed of endeavor, describes in col. 1 lines 20-25, 45-47 etc. describe wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film , to crystallize the film at low temperature so as to avoid substrate deformation and reduce the heating time from several ten hours or more necessary for crystallization to about an hour and produce a product having the desired properties .

Therefore it would have obvious to one of ordinary skill in the art at the time of the invention to use Mitnaga's laser annealing in Nitta's method . The motivation for which is to crystallize the film at low temperature so as to avoid substrate deformation and reduce the heating time from several ten hours or more necessary for crystallization to about an hour and produce a product having the desired properties . ( Mitnaga col. 2 lines 10-18 ,etc.).

With respect to claim 3 Nitta describes the method for manufacturing the semiconductor device according to Claim 1, wherein the radiating the semiconductor film with the second laser beam is held in order to eliminate an oxide film on the semiconductor film.

It is noted that the functional recitation , "wherein the radiating the semiconductor film with the second laser beam is held in order to eliminate an oxide film on the

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semiconductor film" has not be given patentable weight because it is narrative in form.

See above under claim 2 In re Fuller, 1929 C.D. 172, 388 O.G. 279.

However , assuming arguendo that Applicants' have recited the limitation in proper format ( Mitanaga jit is a naturally occurring phenomena when annealing by laser ( i.e. heating ) oxides are chemically reduced and conveded to other chemicals i.e. eliminated ).

With respect to claim 7 Nitta describes a method for manufacturing a semiconductor device comprising'. forming a semiconductor film over an insulating surface; radiating the semiconductor film with a second laser beam after radiating with the first laser beam under an atmosphere comprising one of hydrogen and an inert gas, ( Mitanaga col. 10 lines 30-35) and radiating the semiconductor film with a third laser beam after radiating with the second laser beam; wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. ( rest of the steps are rejected for reasons stated above under claim 1) .

With respect to claim 8 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor. ( rejected for reasons set out claim 2 above ).

With respect to claim 9 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein the radiating the semiconductor film with the second laser beam is held in order to eliminate an oxide film on the

semiconductor film. ( rejected for reasons set out under claim 3 above).

With respect to claim 11 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. ( rejected for reasons set out under claim 5 above).

With respect to claim 13 Nitta describes a method for manufacturing a semiconductor device comprising'. forming a semiconductor film over an insulating su/ace; radiating the semiconductor film with a first laser beam; radiating the semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the semiconductor film with a third laser beam after radiating with the second laser beam under an atmosphere comprising one of hydrogen and an ined gas, wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. ( rejected for same reasons as set out under claim 7 above).

With respect to claim 14 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film. ( rejected for same reasons as set out under claim 2 above).

With respect to claim 15 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein the radiating the semiconductor film with' the second laser beam is held in order to eliminate an oxide film on the

semiconductor film. ( rejected for same reasons as set out under claim 3 above).

With respect to claim 17 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. (rejected for same reasons as set out under claim 5 above).

With respect to claim 25 Nitta describes a method for manufacturing a semiconductor device comprising'. forming a semiconductor film over an insulating surface, radiating the semiconductor film with a first laser beam; radiating the semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein an energy of the third laser beam is higher than an energy of the first laser beam, and wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. (Nitta example -1 ,col. 5 lines 35-45).

With respect to claim 26 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film. the first laser beam', and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein a pulse width of the second laser beam is smaller than a pulse width of the first laser beam, and wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a

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wavelength of the first laser beam. (rejected for reason set out under claim 19 above).

With respect to claim 27 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the radiating the semiconductor film with the second laser beam is held in order to eliminate an oxide film on the semiconductor film. ( rejected for reason set out under claim 2 above).

With respect to claim 28 Nitta describes the method for manufacturing the semiconductor device according to Claim 25, wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film. (rejected for reason set out under claim 3 above).

With respect to claim 31 Nitta describes a method for manufacturing a semiconductor device comprising: forming a semiconductor film over an insulating surface; crystallizing the semiconductor film by a heat treatment to form a crystallized semiconductor film', radiating the crystallized semiconductor film with a first laser beam; radiating the crystallized semiconductor film with a second laser beam after radiating with the first laser beam; and radiating the crystallized radiating with the second laser beam, semiconductor film with a third laser beam after wherein a wavelength of the second laser beam and a wavelength of the third laser beam are different from a wavelength of the first laser beam. ( rejected for reason set out under claims 1 ,7, etc. above).

With respect to claim 32 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein the radiating the crystallized semiconductor film with the first laser beam is held in order to improve a crystal

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characteristic of the crystallized semiconductor film.( claim 2 )

With respect to claim 33 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein the radiating the crystallized semiconductor film with the second laser beam is held in order to eliminate an oxide film on the crystallized semiconductor film. ( claim 3 ).

**B.** Claims 4,6, 10, 12, 16, 18-24, 29-30, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. ( U.S. Patent No. 6,304,329, herein after Nitta) and in view of Mitnaga et al. ( U.S. Patent No. 5,808,321, herein after Mitnaga) as applied to claims 2-3,6 et. and further in view of Ouderkrik et al. ( U.S. Patent No. 4,879,176 herein after Ouderkrik) .

With respect to claim 4, Nitta describes the method for manufacturing the semiconductor device according to Claim 1 , wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film.

It is noted that the functional recitation , "wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film" has not be given patentable weight because it is narrative in form. See above under claim 2 In re Fuller, 1929 C.D. 172, 388 O.G. 279.

Nitta and Mitnaga do not specifically describe the step of wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film.

However , assuming arguendo that Applicants' have recited the limitation in



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proper format Ouderkrik, a patent from the same field of endeavor describes in Col. 5 lines 38-64 ,etc. the step of wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film to form a semiconductor device with reduced optical reflectance , increased optical transmission, increased coating adhesion, a non-yellowed (non-degraded) surface, and a non textured surface.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Ouderkrik's step of wherein the radiating the semiconductor film with the second

laser beam is held in order to level a surface of the semiconductor film. In Nitta and Mitnaga's method . The motivation to arrive at the above combination is to form a semiconductor device with reduced optical reflectance , increased optical transmission, increased coating adhesion, a non-yellowed (non-degraded) surface, and a non textured surface. ( Ouderkrik col.4 lines 54-58, etc. ).

With respect to claim 6 Nitta describes the method for manufacturing the semiconductor device according to Claim 1, wherein an energy density of the first laser beam is 300 to 500mJ/cm. (Mitnaga Col. 12 lines 13-15, see also Ouderkrik col. 3 lines 25-30 example 5 , etc.).

With respect to claim 10 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film. ( rejected for reasons set out under claim 4 above).

With respect to claim 12 Nitta describes the method for manufacturing the semiconductor device according to Claim 7, wherein an energy density of the first laser beam is 300 to 500mJ/cm . ( rejected for reasons set out under claim 6 above).

With respect to claim 16 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein the radiating the semiconductorfilm with the second laser beam is held in order to level a surface of the semiconductor film. . ( rejected for same reasons as set out under claim 4 above).

With respect to claim 18 Nitta describes the method for manufacturing the semiconductor device according to Claim 13, wherein an energy density of the first laser beam is 300 to 500mJ/cm . (rejected for same reasons as set out under claim 6 above).

With respect to claim 19 Nitta describes a method for manufacturing a semiconductor device comprising: forming a semiconductor film over an insulating surface, radiating the semiconductor film with a first laser beam; radiating the semiconductor film with a second laser beam aqer radiating with first laser beam and radiating the semiconductor film with a third laser beam after radiating with the second laser beam, wherein a pulse width of the second laser beam is smaller than a pulse width of the first laser beam (Ouderkrik example 10 ) and wherein a wavelength of the second laser beam and a wavelength of the third laser beam are dilerent from a wavelength of the first laser beam. ( rest of the limitations rejected for reasons et out under claims 1,7 etc.).

With respect to claim 20 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein the radiating the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film. ( rejected for reasons set out under claim 2 above).

With respect to claim 21 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein the radiating the semiconductor film with the second laser beam is held in order to eliminate an oxide film on the semiconductor film. radiating the semiconductor film with a second laser beam after radiating with the first laser beam. ( rejected for reasons set out under claim 3 above).

With respect to claim 22 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein the radiating the semiconductor film with the second laser beam is held in order to level a surface of the semiconductor film. ( rejected for reasons set out under claim 4 above).

With respect to claim 23 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. ( rejected for reasons set out under claim 5 above).

With respect to claim 24 Nitta describes the method for manufacturing the semiconductor device according to Claim 19, wherein an energy density of the first laser beam is 300 to 500mJ/cm . ( rejected for reasons set out under claim 6 above).

With respect to claim 29 Nitta describes the method for manufacturing the

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semiconductor device according to Claim 25, wherein the method further comprises a step of forming an oxide film on the semiconductor film before radiating the semiconductor film with the first laser beam. (rejected for reason set out under claim 5 above ).

With respect to claim 30 describes the method for manufacturing the semiconductor device according to Claim 25, wherein an energy density of the first laser beam is 300 to 500mJ/cm .( rejected for reason set out under claim 6 above ).

With respect to claim 34 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein the radiating the crystallized semiconductor film with the second laser beam is held in order to level a surface of the crystallized semiconductor film. ( claim 4)

With respect to claim 35 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein the method further comprises a step of forming an oxide film on the crystallized semiconductor film before radiating the crystallized semiconductor film with the first laser beam. ( claim 5).

With respect to claim 36 Nitta describes the method for manufacturing the semiconductor device according to Claim 31, wherein an energy density of the first laser beam is 300 to 500mJ/cm . ( claim 6).

### ***Response to Arguments***

Applicant's arguments filed on November 23, 2005 have been fully considered but they are not persuasive for the following reasons :

Applicants' first contention to hold in abeyance the double patenting rejection is not persuasive at least for the reason that Applicants' have not amended any claims and if held in abeyance and because the same claims are rejected twice Applicants' choose to appeal then the double patenting issue may not be considered therefore the abeyance cannot be granted and the double patenting rejection is made Final.

Applicants' contention with respect to MPEP Section 2163.03(III) ( i.e. original claims form part of disclosure ) and its relevance to the present situation is not clear because Applicants' have not cited any reference in the Office Action to their claims being entitled to the broadest scope consistent with their specification.

Applicants' reference that they are entitled to broadest scope consistent with their specification is not disputed and Applicants' have not cited any reference in the Office Action to this issue.

Applicants' contention "that an enablement rejection on the grounds that a disclosed critical limitation is missing from the claims also requires the specification to make it clear that the limitation is critical for the invention to function as intended " is correct.

Applying the above standard ( as also set out by the Applicants' ) to the present application ONE CANNOT BUT CONCLUDE that the formation of an oxide layer is a critical and necessary step for the invention to function as intended because the specification ONLY describes radiating the semiconductor film through an oxide layer that covers it.

The present claims are directed to a method that do not include an oxide layer covering the semiconductor film, and therefore cannot perform the critical steps of radiating the semiconductor film through an oxide film. without the recitation of the critical step of forming an oxide layer covering the semiconductor film.

Therefore the invention will not function as intended.

Further the recited steps of second and third radiations will not be necessary and the second radiation step is intended to remove the remaining oxide layer and this step cannot be performed if there is no oxide layer present. The third radiations step is necessary to smooth the semiconductor surface that is uneven after the two radiation steps and will not be necessary if the second step is not necessary.

Thus completely destroying the invention to function as intended.

Therefore the oxide layer as described in the specification is critical and MUST be recited in the claims.

The Applicants' next contention w.r.t rest of 112 rejection can be only be responded to by stating that lack of specific reasons why the rejection is improper means that there are no genuine issues or grounds for alleging improper rejection and the rejection is proper.

Applicants' however by raising extraneous issues have attempted to avoid the main issue namely

Independent claims 1, 7,13,19, 25 and 31 fail to recite the step of " forming an oxide film on a surface of the above semiconductor film" therefore the claims) contains

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subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants' invention as described in their specification as originally filed ONLY describes radiating the semiconductor film through an oxide layer that covers the semiconductor film, therefore the step of radiating the semiconductor film by the first laser beam without an oxide covering layer is not described in the specification and not enabled. ( all of the embodiments in the specification) .

Further the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam ( at particular parameters e.g. ARF laser at 193nm at 30 Hz and energy density mJ/cm<sup>3</sup>) is described in their specification as originally filed ONLY as the step (of the second laser beam radiation) to perform abrasion of the oxide film on the crystallized semiconductor film thereby eliminating the oxide film. As Applicants' presently recited independent claims do not recite semiconductor film as having an oxide film there is no need to perform the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam because it is not necessary to perform abrasion of the oxide film on the crystallized semiconductor film thereby eliminating the nonexistent oxide film.

Further the step of radiating the semiconductor film with a third laser beam after radiating with the second laser beam is also not necessary since the step of radiating the semiconductor film with a second laser beam after radiating with the first laser beam because it is not necessary to perform abrasion of the oxide film on the crystallized

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semiconductor film thereby eliminating the nonexistent oxide film, therefore there is no  
Necessity of performing the third step.

Therefore the invention as a whole which consists of treating a semiconductor  
film having an oxide film there over with radiation of three kinds of Laser beams to from  
A level/smooth semiconductor film falls apart.

Further all the embodiments in the specification describe the step of forming an  
Oxide film on a surface of the above semiconductor film to form a semiconductor film  
Having a leveled surface, which are necessary for the invention to produce the desired  
Results:

( a ) "the roughness of the inter face between the semiconductor layer and the  
gate insulating film traps a carrier ( electron ) flowing through the channel forming region  
so that the carrier would become a fixed electric charge to vary a threshold voltage,  
which causes decline in reliability .'

(b) the presence of the oxide film is necessary for the laser beam radiation of  
the semiconductor film in order from ( of ) the first condition, second condition and the  
third condition enables a process from crystallization to leveling to be performed without  
changing an atmosphere in a process room which can shorten time for operation and  
reduced costs.

( c ) the presence of the oxide film is necessary for the laser beam radiation of  
the semiconductor film in order from ( of ) the first condition, second condition and the  
third condition enables a process from crystallization to leveling to be performed without  
changing an atmosphere in a process room which can shorten time for operation thus



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providing a process wherein the substrate is not contaminated since the process from crystallization to leveling can be continuously carried out without exposure to air .

( d) the step of forming an oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface which are necessary for the invention to produce the desired result of a level surface of the semiconductor film which reduces/ eliminates the electric field focusing problem.

(e) the step of forming an oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface which are necessary for the invention to produce the desired result of a level surface of the semiconductor film which reduces/ eliminates the presence of current if OFF position due to the stability of the thickness ( i.e. leveling of the surface).

The dependent claims are rejected for at least depending from rejected independent claims.

The invention as a whole which consists of treating a semiconductor film having an oxide film there over with radiation of three kinds of Laser beams to form A level/smooth semiconductor film falls apart.

Further all the embodiments in the specification describe the step of forming an Oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface, as critical steps which are necessary for the invention to produce the desired and without which the invention will not produce the desired results and therefore there will be no invention to patent.

The specification /disclosure herein can ONLY be interpreted/understood by one skilled in the art to include the critical steps of forming an Oxide film on a surface of the above semiconductor film to form a semiconductor film having a leveled surface, as critical steps which are necessary for the invention to produce the desired and without which the invention will not produce the desired results and therefore there will be no invention to patent i.e language of the specification makes it clear that the limitation is critical for the invention to function as intended .

Therefore the absence of these critical steps from the claims on correct application of MPEP 2164.08(c) can only result in making the previously applied rejection Final.

Applicants' next contention that instant claims 7 and 13 allegedly recite Different features is not persuasive because they recite substantially the same subject matter in different ways.

Applicants'/ attorneys' contention with respect to claims 1 and 5 that the cited portion of Nitta ( i.e. USP 6,304,329) namely col. 9 lines 2-3 only describes forming an insulating film on a laser, not a semiconductor film is not persuasive because Applicants'/attorneys' contention are not consummate in scope with the presently recited claims which do not recite the step of forming a semiconductor film on a laser therefore this contention is not persuasive .

Further Applicants'/Attorneys' have not understood the cited portion wherein in alternative embodiments the substrate can include several desired material including SOI ( Silicon –on –insulator) in which embodiment it will be clear to one of ordinary skill

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in the art that a silicon layer is formed on the laser and in other embodiments an insulating layer may also be formed on a laser . Therefore Applicants' attempt to limit Nitta's teaching fail and Applicants' have not over come applied prior art.

Applicants' contention that the applied Nitta reference does not disclose radiating the semiconductor film with laser beams because Nitta's "elements' 52,53 and 54 are laser diodes provided in order to detect angular velocity off the other object.. " is also not persuasive because Applicants'/attorneys' have considered the teachings at col. 8 lines 5 to 12 of Nita which describe that ( prior art to Nita) methods of using semiconductor laser for growing crystals by radiating laser beam on the semiconductor to crystallize the crystal is the same as Applicant's description in thier specification. Further Applicants have not understood the cited portion wherein in alternative embodiments the elements 52,53 and 54 also include single/multiple quantum wells ( col. 8 lines 54-57) and further describe in an embodiment in col. 6 lines describes treatment where in laser is incident upon the semiconductor layer .

Further proof of laser beam being projected is col. 9 lines 26-34 which describe insulating films are formed in side surface to contain light (laser ) from exiting and provide total internal reflection and prevent the semiconductor laser from deteriorating.

Applicants' w.r.t claim 7 that Mitnaga's teaching should be limited to furnace anneal is without basis and again Applicants'/attorneys' are attempting to limit the applied references to what they desire and not what the reference teaches . Mitnaga teaches a two step anneal wherein the first step is a laser anneal and in line 65 states the use of a laser light anneal by KFr, etc. It is requested that Applicants'/ attorneys'

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explain how a laser anneal by KFr can be anything other than a laser anneal and especially show how this can be a furnace anneal as alleged.

It is also noted that Applicants' specification page 15 lines 24/26 describe an Electric furnace providing a furnace heating and Applicants' have not excluded the furnace heating from their claims as presently recited.

Applicants' allegation w.r.t claim 31 that Nitta allegedly does not disclose "crystallizing the semiconductor by a heat treatment is not completely understood because claim 31 was rejected for reasons set out under claims 1 and 7, and such a question was raised w.r.t to these claims 1 and 7 rejection .

However , for Applicants' benefit the whole purpose of including Mitnaga as a reference was to show the use crystallizing the semiconductor by a laser heat treatment . Therefore Applicants' have not understood the rejection from page 9 onwards of the previous Office Action because if as Applicants' desire if the Nitta reference was to teach all of the recitation of claim 31 , then the outstanding rejection would be a 102 rejection and not the outstanding 103 .

It is further noted that current case law does not allow Applicants' to negate obviousness by piece meal analysis of the applied references and ignore the combined teachings of the references.

Applicants' argument w.r.t claims 4,6,10,12,16,18-24, 29-30 and 34-36 that Ouderkirk is allegedly from a different filed of endeavor is not persuasive because it will be clear to one of ordinary skill in the art that Ouderkrik is from the same field of endeavor as Nitta and Mitnaga , namely a method of manufacturing a semiconductor

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device because Ouderkrik itself cites several prior art patents on which it ( Ouderkrik) is an improvement including Kawamura which in the last quoted lines states, " ..PMMA a polymer used in preparing photolithography resists for semiconductor fabrication ". ( emphasis supplied). Therefore it is very clear to one skilled in the art that Applicants' instant Application , and the Applied Nitta, Mitnaga and Ouderkrik reference all deal with method of manufacturing a semiconductor device and therefore are from the same field of endeavor .

Further proof that Nita, Mitnaga and Ouderkrik are from the same field of endeavor is that the Ouderkrik patent has been cited at least about 40 times since it was issued as a reference in later issued patents dealing with semiconductor manufacturing .

With respect to Applicants' last argument about not giving patentable weight to the functional limitation " wherein the radiating ( sic.) the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film" it is noted that the outstanding rejection is based upon the limitation not being in proper format " wherein the radiating ( sic.) the semiconductor film with the first laser beam is held in order to form a crystallized semiconductor film appears to Japanese English and something got garbled in the translation.

The applicant must recite the claims in proper format . Merely citing the correct MPEP section 2181 and 35 USC112 DOES NOT translate to the claims being in proper format.

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If Applicants' desire something like the semiconductor film is radiated with first laser beam till the semiconductor film is crystallized" may be substituted for the above phrase. ( as was also previously stated).

It is noted that in order to further the prosecution the examiner included art rejection assuming Applicants' will recite the claims in proper format. However the Applicants'/attorneys' have completely ignored and outstanding rejection and argued unrelated issues or matter thus proving there are no real arguments to the examiner's rejection and only unrelated non relevant issues must be presented to include some arguments in their response.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571) 272-

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1718. The examiner can normally be reached on 8.00 to 5.00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

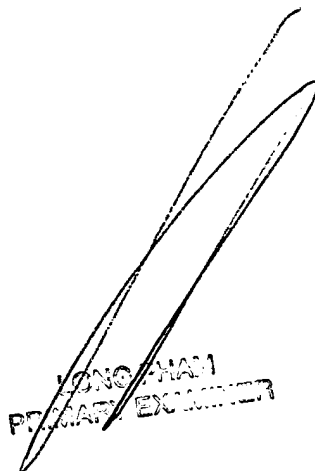
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H. Rao

Patent Examiner

Feb. 04, 2006.



LONG/HAN  
PATENT EXAMINER